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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/521,498

08/29/2005

Georg Tempel

10808/201

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48581

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08/13/2008

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EXAMINER

WEISS, HOWARD

ART UNIT

PAPER NUMBER

2814

MAIL DATE

DELIVERY MODE

08/13/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/521,498	<b>Applicant(s)</b> TEMPEL, GEORG	
	<b>Examiner</b> Howard Weiss	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 9-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

Attorney's Docket Number: 10808/201

Filing Date: 8/29/2005

Continuing Data: 371 of PCT/DE03/02352 (07/11/2003)

Claimed Foreign Priority Date: 7/15/2002 (GEX)

Applicant(s): Tempel

Examiner: Howard Weiss

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 9, 11, 12, 14 to 19, 23, 24 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Legoues et al. (U.S. Patent No. 5,810,924).

Legoues et al. show all aspects of the instant invention (e.g. Figure 1) including:

- forming a Si crystalline carrier **12** with a (100) surface orientation with a carrier lattice constant
- forming a SiGe crystalline stress generator layer **16** with a carrier lattice constant
- forming a CaF<sub>2</sub> insulating stress-transmitting layer **18** (Column 15 Lines 13 to 24) with a first lattice constant different from the carrier lattice constant
- forming a Si stress-absorbing, crystalline semiconductor layer **22** with a second lattice constant similar to the first lattice constant
- forming a high dielectric constant gate dielectric **26** and a metal control layer **35** on said Si stress-absorbing semiconductor layer and source/drain regions **37,38** in said Si stress-absorbing semiconductor layer

In reference to the claim language pertaining to the enhancement of mechanical stress transmission by the insulating stress transmission layer and the improvement of charge carrier mobility and other electrical properties by the stress absorbing

layer, the claiming of a new use, new function, or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 195 USPQ 430, 433 (CCPA 1977) and *In re Swinehart*, 439 F. 2d 210, 169 USPQ 226 (CCPA 1971); please see MPEP § 2112. Since Legoues et al. show all the features of the claimed invention, the enhancement of mechanical stress transmission by the insulating stress transmission layer and the improvement of charge carrier mobility and other electrical properties by the stress absorbing layer are an inherent property of Legoues et al.'s invention.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
  - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Legoues et al. and Cho (U.S. Patent No. 5,569,538).

Legoues et al. show most aspects of the instant invention (Paragraph 2) except for the buffer layer epitaxially deposited on the Si carrier and using molecular beam epitaxy process. Cho teaches (e.g. Figure 1 and Column 3 Lines 55 to 62) to form a buffer layer **22** epitaxially deposited on a Si carrier **20** and using molecular beam epitaxy process to form an SOI structure without defects (Column 2 Lines 11 to 20). It would have been obvious to a person of ordinary skill in the art at the time of invention to form a buffer layer epitaxially deposited on a Si carrier and using molecular beam epitaxy process as taught By Cho in the process of Legoues et al. to form an SOI structure without defects.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Legoues et al. and Kim et al. (U.S. Patent No. 6,475,857).

Legoues et al. disclose the claimed invention (Paragraph 2) except for the use of the explicitly use of  $\text{HfO}_2$  as the gate dielectric and TiN as the control layer. Kim et al. 2 teach (Column 11 Lines 19 to 29 and Column 13 Lines 5 to 8) that  $\text{HfO}_2$  and TiN are equivalent gate dielectric and control layer materials known in the art. Therefore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of invention. See Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 550 U.S. --, 82 USPQ2d 1385 (2007).

6. Claims 21, 25, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Legoues et al.

Legoues et al. discloses the claimed invention (Paragraph 2) except for explicitly forming and patterning the gate dielectric and control layer to define a channel a channel length L such that the stress-absorbing layer thickness d is less than one-third L. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form and pattern the gate dielectric and control layer to define a channel a channel length L such that the stress-absorbing layer thickness d is less than one-third L, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Legoues et al. state that d can be of arbitrary thickness (Column 6 Lines 55 and 56) and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of invention. See Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 550 U.S. --, 82 USPQ2d 1385 (2007).

Additionally, since the Applicant has not established the criticality of the thicknesses and lengths stated and since these thicknesses and lengths are in common use in similar devices in the art, it would have been obvious to one of ordinary skill in the art to use these values in the device of Legoues et al. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

### ***Response to Arguments***

7. Applicant's arguments filed 5/28/2008 have been fully considered but they are not persuasive. The Applicant states that the layers in the process of Legoues et al. migrates the stressor strain to the layers' edges instead of transmitting and absorbing the stress as featured in the instant invention. There are two reasons this is not persuasive arguments. First, the redistribution of the stresses as described by Legoues et al. is transmission and absorption. Secondly, as stated in the rejections above, stress transmission and absorption are inherent properties of these layers regardless how they are characterized in the prior art. The Specification does not state any extraordinary or other processing that would distinguish it from the prior art. Therefore, one of ordinary skill in the art would expect the transmission and absorption properties of the layers in the prior art to be the same as in the instant invention. In view of these reasons and those set forth in the present office action, the rejections of the stated claims stand.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Papers related to this application may be submitted directly to Art Unit 2814 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The Art Unit 2814 Fax Center number is **(571) 273-8300**. The Art Unit 2814 Fax Center is to be used only for papers related to Art Unit 2814 applications.
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Howard Weiss at **(571) 272-1720** and between the hours of 7:00 AM to 3:00 PM (Eastern Standard Time) Monday through Friday or by e-mail via [Howard.Weiss@uspto.gov](mailto:Howard.Weiss@uspto.gov). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached on **(571) 272-1705**.
11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at **866-217-9197** (toll-free).

12. The following list is the Examiner's field of search for the present Office Action:

Field of Search	Date
U.S. Class / Subclass(es): 257/ E21.125	thru 8/11/2008
Other Documentation: none	
Electronic Database(s): EAST	thru 8/11/2008

HW/hw  
13 August 2008

/Howard Weiss/  
Primary Examiner  
Art Unit 2814